

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-22 are presently active in this case, Claims 1, 9, 18 and 20 amended, and Claims 21-22 added by way of the present amendment.

In the outstanding Office Action, Claims 1-16 and 18-20 were rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 6,323,052 to Horie et al.; and Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Horie et al..

First, Applicants wish to thank Examiner Jackson and Supervisory Patent Examiner (SPE) Ip for the December 11, 2003 personal interview, at which time the outstanding issues in this case were discussed. During the discussion, Applicants presented amendments and arguments substantially as indicated in this response. While no agreement was reached, the Examiners indicated that the feature of the "FIT number" included in the independent claims by way of this amendment, is not inherently found in the prior art of record. Moreover, the Examiners indicated that a product-by-process claim directed to the present invention would not be subject to restriction requirement.

Turning now to the merits, in order to expedite issuance of a patent in this case, Applicants have amended independent Claims 1, 8, 18 and 20 to recite that the semiconductor laser device has a fault in time (FIT) number of approximately 1000 or less when calculated using the formula  $\text{FIT} = (\text{fault number} \times 10^9)/(\text{operating time} \times \text{operating number})$ .

As discussed in the December 11<sup>th</sup> personal interview, the present inventors discovered that providing a facet reflective coating having a resistivity of  $1 \times 10^{12}$  or higher provides increased reliability for the laser device. Specifically, as seen in Figure 5 of the present application, laser devices having a resistivity greater than  $1 \times 10^{12}$  according to the

present invention are shown by the darkened circles of this figure to have a FIT number of approximately 1000 or lower. In contrast, laser devices having a reflective film with a resistivity less than  $1 \times 10^{12}$  are shown by the undarkened circles to have a FIT number of higher than 1000. Because the lower FIT number demonstrates an increased reliability, Applicants have identified a specific range of resistivity of the reflective film that provides an unexpected result of improved reliability expresses as a FIT number. This FIT number and related resistivity is now recited in independent Claims Claims 1 and 20.

Similarly, as described in Applicants specification, the improved reliability of the present invention also relates to the  $\text{Al}_2\text{O}_3$  coating having a composition close to the stoichiometric ratio. Thus, independent Claims 8 and 18 have been amended to recite that the low reflection film comprises essentially  $\text{Al}_2\text{O}_3$  having a stoichiometric ratio composition and the the semiconductor laser device has a fault in time (FIT) number of approximately 1000 or less when calculated using the formula:  $\text{FIT} = (\text{fault number} \times 10^9)/(\text{operating time} \times \text{operating number})$ .

In contrast, as discussed in the December 11, 2003 interview, the cited reference to Horie et al. makes no mention of a FIT number of approximately 1000 or less. Indeed, this reference does not teach or suggest any correlation between resistivity or stoichiometric ratio of the reflective coating and reliability (quantified by FIT number). Thus, Applicants' independent Claims 1, 8, 18 and 20, as presently amended, patentably define over the cited reference to Horie et al. Moreover, as Claims 2-7, and 9-19 depend from these independent claims, Claims 2-7 and 9-19 also patentably define over the cited reference to Horie et al.

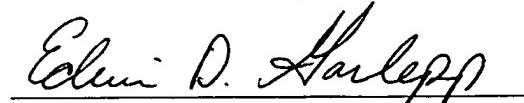
With regard to new Claim 21, this claim has been added to address the Examiners' concern that the invention argued in the December 11<sup>th</sup> interview is more properly covered by a process claim. Thus, Claim 21 has been written in product-by-process claim format in order to avoid a restriction requirement and withdrawal by constructive election. As

discussed in the December 11<sup>th</sup> interview, Horie et al. does not disclose, either explicitly or inherently, a process for forming low reflection film of Al<sub>2</sub>O<sub>3</sub> having a resistivity of 1 x 10<sup>12</sup> Ω·m or more and therefore Claim 21 patentably defines over this reference. Applicants further note that Claims 17 and 22 recite that the Al<sub>2</sub>O<sub>3</sub> film is formed by an electron cyclotron resonance plasma sputtering, which is the preferable process for forming the Al<sub>2</sub>O<sub>3</sub> film. This process is also not disclosed in the cited reference to Horie et al. This provides an additional basis for patentability of Claims 17 and 22.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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